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THE PLACE OF HOG PRODUCTION IN CORN-BELT FARMING

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SUMMARY

The farm costs involved in the production of over three million pounds of pork in three different areas of Illinois are presented and analyzed in this bulletin. These data represent over two hundred full-year records from more than fifty different farmers who cooperated with the University in keeping records.

Wide variations in cost occurred in the three areas. In Hancock county, the most important hog-producing area of the state, the co-operating farmers averaged a profit of $1.97 a hundredweight over the ten-year period 1913 to 1922, while in Franklin county a profit of $1.44 was realized. In Champaign and Piatt counties the farmers lost an average of 58 cents a hundredweight over the six-year period 1920 to 1925 because of unfavorable price conditions during a part of that time.

The place which hog production may fill on any particular farm depends, in large measure upon the peculiarities of the farm and upon the ability of the manager in handling and marketing hogs. Each year some of the cooperators in each area produced hogs at a profit in spite of conditions which proved unfavorable to others. For instance, among ten farms in Champaign and Piatt counties the cost of production ranged from $7.76 a hundredweight to $13.72, as an average over a four-year period.

In fitting the enterprise into the general farm scheme a manager needs to consider the physical character of the farm, the grain and concentrate feeds required to be bought or raised, the advantage of combining hog production with other livestock production, labor requirements thruout the year, the size of the enterprise, the extent to which crops may be fed off, how the enterprise fits into the scheme of soil maintenance, the time of year when the hogs can be marketed, and differences in the abilities of men in raising hogs.

The hog enterprise, because of its flexibility both as regards the numbers which may be produced within a short time and the weights to which hogs may profitably be fed, offers to corn-belt farmers one of the best means of adjusting production to take advantage of changes in the relative prices of farm products, especially corn and hogs.

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By H. C. M. Case, Associate Chief in Farm Organization and Management, and Robert C. Ross, Associate

Hog production is the leading livestock enterprise thruout central Illinois. Several reasons combine to give it an important place in corn-belt farming. In the first place it is profitable over a period of years; again, it fits into the plan of operating many farms, especially in helping to market a large part of the corn crop; and finally, it affords one of the best means by which the corn-belt farmer can adjust his farm production to meet changing market conditions.

Cost-of-production studies which have been conducted in different parts of Illinois since 1913 by the University of Illinois show that after deducting all costs the production of hogs has generally resulted in a profit. Some farms have made much larger profits than others, but on the average hog production on the farms studied has proved directly profitable. Direct profits alone are sufficient to explain the important place which hogs hold in the organization of corn-belt farms.

In addition to being a "direct profit" enterprise, hog production, as suggested above, fills an important place in corn-belt farming by reason of the fact that it offers a way of marketing much of the corn crop. With most crops there is the alternative of selling them directly or in the form of livestock and livestock products. Approximately 85 percent of the total corn crop, which is the most important Illinois crop, is fed mainly on the farms where produced or in the immediate locality, and of this amount about half is fed to hogs.

The third point mentioned above, the value of the hog enterprise as a means of adjusting the sale of farm products to market demand, is realized when one notes the great fluctuations in the relation between corn and hog prices that occur from one season to another. Over a period of years the average price of 100 pounds of hogs has been equivalent to the average price of 11 to 12 bushels of corn. During the period covered by this study, however, the ratio of the price of hogs to the price of corn has varied from the equivalent of 7 bushels of corn to 17 bushels. Since hogs can be increased rapidly in numbers and can be marketed at a considerable range in weight, they offer one of the best means of adjusting farm production from season to season to an abundant or short corn crop.

Note.—The material presented in this bulletin is based upon investigations initiated by the Department of Animal Husbandry in 1912 and upon subsequent studies by the Department of Farm Organization and Management after that department was organized in 1917. Valuable assistance and constructive criticism was given in the preparation of Part III by Dr. W. E. Carroll, Chief in Swine Production.

The extent to which a particular farmer will produce hogs over a period of time should be decided, however, not merely on the basis of these three factors but by consideration also of the many factors making for good farm practice.

PART I—COST OF PRODUCING HOGS

The cost studies on which Parts I and II of this publication are based were made in Hancock and Franklin counties during the ten years 1913 to 1922 and in Champaign and Piatt counties in the years 1920 to 1925.[1] Costs are recorded on the production of 2,257,675 pounds of pork in Hancock county, 299,669 pounds in Franklin county, and 831,282 pounds in Champaign and Piatt counties, a total of more than 3,000,000 pounds.

Hancock county is in west-central Illinois bordering on the Mississippi river and is in the principal beef-cattle and hog-producing section of the state. Franklin county is in the central part of the southern one-fifth of the state, and is in an area of mixed types of farming where pork production is of minor importance. Champaign and Piatt counties are in the east-central part of Illinois in the region known as the grain farming area of the state. Here the corn sales exceed the value of hog sales by a wide margin.

Despite the abnormal price conditions which occurred during the period of these studies and the high costs in relation to sales price during the more recent years, hog production proved to be a profitable enterprise on typical Illinois farms. This was true in areas where it is of minor importance as well as where it is one of the major farm enterprises. However, there were wide variations in cost between different areas and between different periods, and between different farms

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[1]In gathering the facts on which this publication is based, eight to twelve farmers operating typical Hancock county farms cooperated with the University each year, keeping detailed records of the cost of all farm products and the profit or loss realized from each productive enterprise.

A like number of records were secured in Franklin county with the exception of the last year of the period, when the number of farms decreased to three. In Champaign and Piatt counties an average of about 14 records was secured for each of the six years.

The object of these studies has been to determine the conditions which make for more profitable systems of farming in different parts of the state. The data secured are valuable for this purpose because they extend over a number of years and so fluctuations due to seasonal conditions and changes in price levels are rounded off and results given which represent average conditions. Also, since these studies include a record of all parts of the farm business, it is possible to show more accurately the relation of any single enterprise, such as hog production, to the rest of the farm business, as well as to show how the enterprise may be conducted more economically. Such an analysis should help farmers to arrange their business to meet changing economic conditions.

in the same area in the same year, as pointed out in the following paragraphs.

Costs Vary in Different Areas

In Hancock county pork production on the farms studied gave for the ten-year period an average direct profit of $1.97 a hundredweight. For the same period in Franklin county, where pork production is a minor enterprise, a profit of $1.44 was realized. In Champaign and Piatt counties the farmers lost an average of 58 cents a hundredweight during the six-year period 1920-1925. In this area only the first three years of data coincide with those from the other areas.

FIG. 1.—DISTRIBUTION OF HOGS IN ILLINOIS AND AREAS STUDIED

The above map is based on average numbers during 1920-1924. Each dot represents 5,000 hogs.

Thruout the ten-year period the average price received by the Hancock county producers exceeded the average cost of production (Table 1 and Fig. 2). In Franklin county this was true during six of the ten years, and on the whole the margins of profit in years when there was a profit exceeded the margins of loss in other years. These results in Franklin county are good considering that swine production is of minor importance and that the number of hogs was not large

enough to make possible as economical production as on farms where the enterprise was larger.

In Champaign and Piatt counties in 1920, 1921, 1922, and 1925 the hogs sold at a profit. During 1923 and 1924, however, they failed to sell for the cost of production. This was due to the fact that during

FIG. 2.—AVERAGE COST AND SELLING PRICE OF HOGS ON FARMS IN THE THREE AREAS STUDIED

In Hancock county the price received for hogs exceeded the average cost of production in each of the ten years. In other words, hogs returned a profit to the producers. In Franklin county this was true for six out of ten years, and in Champaign and Piatt counties for four out of six years.

the greater part of this two-year period the farm price of hogs was equal to only about 8 bushels of corn. In 1924, owing to a short national crop, corn went above $1.00 a bushel. This high price for corn coupled with a large supply of hogs caused an abnormal spread between the price of hogs and the cost of producing them. On the

cooperating farms hogs sold for an average of only $7.49 a hundredweight, while they were produced that year at an average cost of $11.36 (Table 1).

TABLE 1.—AVERAGE COST OF PRODUCING 100 POUNDS OF HOGS ON COOPERATING FARMS IN HANCOCK AND FRANKLIN COUNTIES, ILLINOIS, FROM 1913 TO 1922, IN CHAMPAIGN AND PIATT COUNTIES FROM 1920 TO 1925; AND PRICE AT WHICH SOLD

	Hancock county		Franklin county		Champaign and Piatt counties	
	Cost of production	Price of hogs sold	Cost of production	Price of hogs sold	Cost of production	Price of hogs sold
1913	$ 6.12	$ 8.48	$ 6.98	$ 7.87	.....	.....
1914	7.31	7.98	6.34	7.88	.....	.....
1915	6.93	7.22	8.58	6.96	.....	.....
1916	7.56	9.84	8.22	9.60	.....	.....
1917	12.64	16.08	10.07	14.76	.....	.....
1918	11.86	16.99	13.09	15.92	.....	.....
1919	15.43	15.95	15.23	15.55	.....	.....
1920	11.75	12.76	14.35	11.08	$12.36	$13.25
1921	6.08	8.49	9.69	8.29	8.41	8.48
1922	6.42	9.14	9.62	8.68	6.74	9.10
1923	.....	.....	.....	.....	8.71	7.46
1924	.....	.....	.....	.....	11.36	7.49
1925	.....	.....	.....	.....	10.69	11.93

Wide Variations in Profits Between Farms

Some farmers are much more successful than others in the hog enterprise. During each of the ten years for which records were secured in Hancock county, half or more of the cooperators produced hogs at a profit (Fig. 3). During six of the ten years some of them produced at a loss.

The fact that some men were consistently more economical producers than others indicates that average results are not a good guide in measuring the value of an enterprise or a practice to any particular individual, but that a producer must regulate the size of his farm enterprises in accordance with his ability to handle them. The extent to which men vary in their ability to produce hogs is well illustrated by records from a number of individual farms as shown in Part II, pages 166 to 168.

Variations in Cost During Different Periods

The cost of producing hogs shows wide variation not only between farms but between different periods on the same farm. From 1913 to 1916 fairly stable conditions prevailed; from 1917 to 1919 the abnormal price conditions resulting from the World War greatly increased costs; while from 1920 to 1922 agricultural prices were depressed.

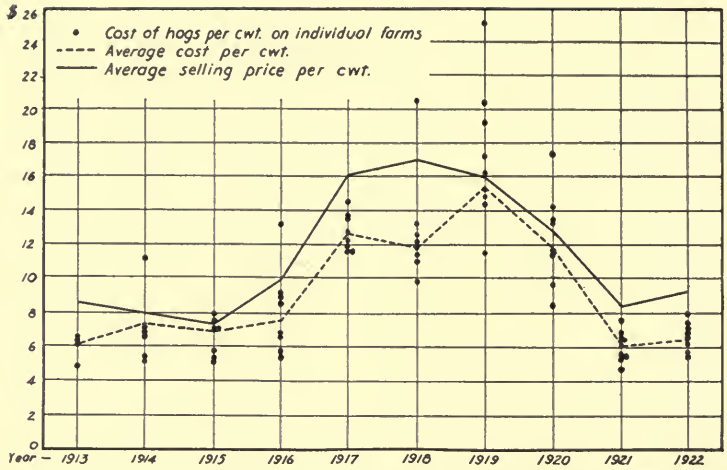

FIG. 3.—COST OF PRODUCING 100 POUNDS OF HOGS ON THE HANCOCK COUNTY FARMS STUDIED

The lines showing average cost of production and selling price are the same as in the upper section of Fig. 2. The dots are added to show how the individual farms stood with respect to cost of production. It will be noted that during each of the ten years one-half or more of the cooperators produced hogs at a profit, and that in four years of the ten they all made a profit.

In Hancock and Franklin counties the average cost per hundredweight by periods was as follows:

	Hancock	*Franklin*
1913-1916	$7.04	$7.65
1917-1919	13.32	13.10
1920-1922	8.00	11.25
Ten-year weighted average	9.57	11.15

This average cost for the entire period for Franklin county is somewhat higher than that for Hancock, due mainly to the relatively larger production from 1917 to 1919, when costs were high. On the farms in Champaign and Piatt counties cooperating in this study hogs were produced at a cost of $9.18 per hundred pounds during the six-year period from 1920 to 1925.

Feed Is Largest Item of Cost

Feed made up from 72 to 89 percent of the total cost of producing pork in the different years of the ten-year period in Hancock county. During six of the ten years it made up 75 to 85 percent of the total cost, the higher and lower extremes representing abnormal conditions. For example, with the rapid advance in the price of corn resulting from the World War conditions in 1917, the feed cost of 100 pounds of

gain averaged $11.13, or 88.1 percent of the total cost. In 1921 the other extreme was reached when the feed cost was only $4.40, or 72.6 percent of the total cost. This low cost in 1921 was due to the general break in prices in 1920, when all farm products were abnormally low (Table 2).

For the entire period in Hancock county the costs were made up as follows: feed 84.1 percent, man labor 5.9 percent, horse labor .8 percent, interest 2.8 percent, buildings and equipment 1.6 percent, overhead 2.6 percent, and miscellaneous 2.2 percent (Table 3).

In Franklin county for the same period man labor, horse labor, and overhead made up a larger proportion of the total cost (Table 5). For the six-year period in Champaign and Piatt counties feed made

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HOW THE DIFFERENT ITEMS OF COST WERE DETERMINED:

1. *Cost of Feed.*—This was determined for each month at farm prices; that is, in the case of home-grown feeds the cost charged to the hogs was the local market price less the cost of hauling to market, and in the case of purchased feed it was the local market price plus the cost of hauling to the farm. As a check on the daily feed record kept by the farmer, the feeds on hand were carefully measured each month.

2. *Man Labor.*—The rate per hour for all hired labor was determined by dividing the total labor cost for the month by the hours of labor performed by hired help during the month. The labor of members of the family not paid a definite wage was charged at the average monthly rate of hired labor on all the cooperating farms. The amount of labor spent in caring for hogs was recorded daily by the cooperator and checked by the route man on his visits to the farm.

3. *Horse Labor.*—The cost of horse labor per hour was determined by dividing the total cost of keeping horses for the entire year by the number of hours of horse labor performed on the farm during the year. The hog enterprise was then charged with the number of hours devoted to it.

4. *General Farm Expense.*—There are always expenses incurred in the operation of the farm that cannot be charged directly to any one farm enterprise but must be shared by all the productive enterprises. The more important items included here are taxes, automobile expense incurred in operating the farm, fencing, maintenance of the farmstead and water system, and such minor items as telephone service. The share of these expenses to be charged to each productive enterprise was determined by the proportion of man labor devoted to the enterprise. This seems to be as accurate and fair a basis as any for making this division.

5. *Interest.*—This charge includes interest on the total investment in hogs charged at the rate usually paid on borrowed money.

6. *Buildings and Equipment.*—The annual cost includes depreciation, upkeep, and interest on buildings, feeders, waterers, and other miscellaneous equipment. Where such buildings and equipment are shared with other livestock, the amount to be charged to hogs is estimated as accurately as possible.

7. *Miscellaneous Expenses.*—These include such items as veterinary fees, medicines, and personal expenses of the operator in purchasing and selling hogs.

Death risk is not figured as a cost of production since all costs of producing hogs that died are charged against the hogs actually produced and sold. No excessive losses occurred on the farms of the cooperators, and altho there was considerable loss on some farms, the large amount of data included in this study over so long a period of time is believed to represent fairly normal conditions.

TABLE 2.—COST OF PRODUCING 100 POUNDS OF HOGS IN HANCOCK COUNTY: BY YEARS, 1913-1922

Items of cost	1913		1914		1915		1916		1917	
	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost
Man labor	$ .44	7.2	$ .52	7.1	$ .46	6.6	$ .49	6.4	$ .56	4.4
Horse labor	.05	.8	.09	1.2	.08	1.1	.08	1.0	.10	.8
Interest	.28	4.5	.19	2.6	.21	3.1	.25	3.3	.32	2.5
Buildings and equipment	.04	.6	.10	1.4	.11	1.6	.10	1.3	.12	.9
Overhead	.29	4.8	.31	4.2	.18	2.6	.22	3.0	.23	1.8
Miscellaneous	.01	.1	.21	2.9	.09	1.2	.11	1.4	.18	1.5
Feed	5.01	82.0	5.89	80.6	5.80	83.8	6.31	83.6	11.13	88.1
Total cost	$6.12	100.	$7.31	100.	$6.93	100.	$7.56	100.	$12.64	100.
Total pork produced	134,464 lbs.		165,775 lbs.		174,381 lbs.		198,455 lbs.		235,742 lbs.	

Items of cost	1918		1919		1920		1921		1922	
	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost
Man labor	$ .53	4.5	$ .64	4.1	$ .73	6.2	$ .64	10.5	$ .48	7.5
Horse labor	.09	.7	.09	.6	.08	.7	.06	.9	.05	.7
Interest	.43	3.6	.29	1.9	.24	2.0	.19	3.0	.22	3.4
Buildings and equipment	.11	.9	.16	1.1	.20	1.7	.21	3.5	.22	3.5
Overhead	.16	1.4	.25	1.6	.31	2.6	.31	5.1	.24	3.7
Miscellaneous	.10	.9	.51	3.3	.26	2.2	.27	4.4	.18	2.8
Feed	10.44	88.	13.48	87.4	9.93	84.6	4.40	72.6	5.03	78.4
Total Cost	$11.86	100.	$15.43	100.	$11.75	100.	$6.08	100.	$6.42	100.
Total pork produced	282,155 lbs.		269,370 lbs.		255,980 lbs.		287,648 lbs.		253,705 lbs.	

TABLE 3.—COST OF PRODUCING 100 POUNDS OF HOGS IN HANCOCK COUNTY: BY PERIODS, 1913-1922

Items of cost	1913–1916		1917–1919		1920–1922		1913–1922	
	Cost per 100 pounds gain	Percent of total cost	Cost per 100 pounds gain	Percent of total cost	Cost per 100 pounds gain	Percent of total cost	Cost per 100 pounds gain	Percent of total cost
Man labor	$ .48	6.8	$ .58	4.4	$ .62	7.7	$ .56	5.9
Horse labor	.08	1.1	.09	.7	.06	.8	.08	.8
Interest	.23	3.3	.35	2.6	.21	2.6	.27	2.8
Buildings and equipment	.09	1.3	.13	1.0	.21	2.7	.15	1.6
Overhead	.25	3.5	.21	1.6	.29	3.6	.25	2.6
Miscellaneous	.11	1.5	.26	2.0	.24	3.0	.21	2.2
Feed	5.82	82.5	11.69	87.7	6.37	79.6	8.06	84.1
Total cost	$7.06	100.	$13.31	100.	$8.00	100.	$9.58	100.
Total pork produced	673,075 lbs.		787,267 lbs.		797,333 lbs.		2,257,675 lbs.	

up only 76.2 percent of the total cost (Table 6). This is accounted for by the lower price of feeds during most of the period.

Since there was so much variation during the ten-year period in the cost of producing pork—from $6.12 a hundredweight in 1913 to $15.43 in 1918 in Hancock county, and a like variation in Franklin county—it is noteworthy that the proportion of total cost made up by feed did not vary more widely (Tables 2 and 4).

The gradual rise in the cost of man labor during the war period and the continued high level during 1919, 1920, and 1921 is reflected in these data. During these three years man labor cost 64, 73, and 64 cents respectively in producing 100 pounds of pork, while it averaged only 48 cents during the first four years of the study.

Horse-labor costs and interest charges were high from 1917 to 1919. Horse-labor costs are made up in large part of the cost of feed; hence the highest costs occurred at those periods when feeds were highest. The interest cost is of course directly proportional to the price of hogs.

Building and equipment costs rose gradually during the ten-year period, reaching their highest point in 1922. This is explained by the continued high prices of building materials, and the fact that farmers made few repairs during the war period and so tended to increase their expenditures in the following years.

The above data indicate how changes in general price conditions affect the cost of producing hogs. Since, however, feed makes up such a large proportion of the total cost, any change in prices at that point is much more quickly reflected in the cost than are changes in other items.

TABLE 4.—COST OF PRODUCING 100 POUNDS OF HOGS IN FRANKLIN COUNTY: BY YEARS, 1913-1922

Items of cost	1913		1914		1915		1916		1917	
	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost
Man labor	$ .37	5.4	$ .36	5.7	$ .72	8.4	$ .87	10.7	$ .58	5.8
Horse labor	.18	2.6	.22	3.4	.24	2.8	.14	1.6	.09	.9
Interest	.20	2.8	.18	2.8	.17	1.9	.20	2.4	.26	2.6
Buildings and equipment	.08	1.1	.09	1.3	.08	.9	.08	.9	.07	.7
Overhead	.42	6.0	.27	4.2	.34	4.0	.26	3.2	.33	3.2
Miscellaneous	...	.0	.17	2.7	.05	.5	.07	.8	.01	.0
Feed	5.73	82.1	5.05	79.9	6.98	81.5	6.60	80.4	8.73	86.8
Total cost	$6.98	100.	$6.34	100.	$8.58	100.	$8.22	100.	$10.07	100.
Total pork produced	19,777 lbs.		23,585 lbs.		17,355 lbs.		32,355 lbs.		46,379 lbs.	

Items of cost	1918		1919		1920		1921		1922	
	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost
Man labor	$ .84	6.4	$ .87	5.7	$ 1.95	13.6	$1.27	13.1	$1.16	12.1
Horse labor	.10	.7	.11	.7	.11	.8	.20	2.1	.08	.9
Interest	.38	2.9	.32	2.1	.25	1.8	.17	1.8	.27	2.8
Buildings and equipment	.07	.5	.05	.3	.14	1.0	.09	.9	.03	.5
Overhead	.44	3.4	.53	3.5	.61	4.3	.47	4.9	.37	3.8
Miscellaneous	.20	1.5	.02	.0	.03	.0	.22	2.2	.20	2.0
Feed	11.06	84.6	13.33	87.7	11.26	78.5	7.27	75.0	7.51	77.9
Total cost	$13.09	100.	$15.23	100.	$14.35	100.	$9.69	100.	$9.62	100.
Total pork produced	57,665 lbs.		57,512 lbs.		13,109 lbs.		18,151 lbs.		13,781 lbs.	

TABLE 5.—COST OF PRODUCING 100 POUNDS OF HOGS IN FRANKLIN COUNTY: BY PERIODS, 1913-1922

Items of cost	1913-1916		1917-1919		1920-1922		1913-1922	
	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost	Cost per 100 pounds gain	Per-cent of total cost
Man labor	$ .61	8.0	$ .78	6.0	$ 1.43	13.	$ .82	7.5
Horse labor	.19	2.4	.10	.7	.14	1.3	.13	1.2
Interest	.19	2.5	.32	2.5	.22	2.0	.27	2.4
Buildings and equipment	.08	1.0	.06	.5	.09	.8	.07	.6
Overhead	.31	4.1	.44	3.4	.48	4.3	.41	3.7
Miscellaneous	.08	1.0	.08	.6	.15	1.4	.09	.8
Feed	6.09	81.0	11.19	86.3	8.51	77.2	9.21	83.8
Total cost	$7.55	100.	$12.97	100.	$11.02	100.	$11.00	100.
Total pork produced	93,072 lbs.		161,556 lbs.		45,041 lbs.		299,669 lbs.	

TABLE 6.—COST OF PRODUCING 100 POUNDS OF HOGS IN CHAMPAIGN AND PIATT COUNTIES, 1920-1925

Items of cost	1920		1921		1922		1923		1924		1925		1920-1925	
	Cost per 100 pounds gain	Percent of total cost	Cost per 100 pounds gain	Percent of total cost	Cost per 100 pounds gain	Percent of total cost	Cost per 100 pounds gain	Percent of total cost	Cost per 100 pounds gain	Percent of total cost	Cost per 100 pounds gain	Percent of total cost	Cost per 100 pounds gain	Percent of total cost
Man labor	$ 1.16	9.4	$ .97	11.5	$ .60	8.9	$ .80	9.2	$ .96	8.4	$ .65	6.1	$ .76	8.3
Horse labor	.10	.8	.18	2.1	.09	1.3	.10	1.1	.12	1.0	.06	.5	.10	1.0
Interest	.32	2.6	.28	3.3	.28	4.2	.27	3.1	.29	2.6	.24	2.2	.27	3.0
Buildings and equipment	.40	3.2	.37	4.4	.20	3.0	.21	2.5	.31	2.7	.20	1.9	.24	2.6
Overhead	.64	5.2	.88	10.5	.46	6.8	.47	5.4	.67	5.9	.43	4.0	.53	5.8
Miscellaneous	.19	1.5	.57	6.8	.31	4.6	.27	3.1	.31	2.8	.16	1.5	.28	3.1
Feed	9.55	77.3	5.16	61.4	4.80	71.2	6.59	75.6	8.70	76.6	8.96	83.8	7.00	76.2
Total cost	$12.36	100.	$8.41	100.	$6.74	100.	$8.71	100.	$11.36	100.	$10.69	100.	$9.18	100.
Total pork produced	35,995 lbs.		64,925 lbs.		234,854 lbs.		161,362 lbs.		132,608 lbs.		201,538 lbs.		831,282 lbs.	

PART II—FACTORS TO CONSIDER IN FITTING THE HOG ENTERPRISE TO THE INDIVIDUAL FARM

The planning of a successful system of farming requires the fitting together of a number of different enterprises in a way which will insure economical production from the entire farm. It is largely an individual matter, for it must take into account the peculiarities of the farm and of the manager himself. Careful attention must be given to the best utilization of the land and the crops produced, the available labor and equipment, the outlay required, the efficiency of operation, and the relation of each part to the entire farm unit.

The place which hog production may be made to fill on any given farm may be said to depend upon the following factors:

(1) The physical character of the farm, (2) the grain and concentrate feeds required to be bought or raised, (3) the advantage of combining hog production with other livestock production, (4) labor requirements thruout the year, (5) the size of the enterprise, (6) the extent to which crops may be fed off, (7) how the enterprise fits into the scheme of soil maintenance, (8) the time of year when the hogs can be marketed, and (9) the manager's own ability in raising hogs.

How the changing relation between the price of corn and the price of hogs may affect the practices of handling hogs and the sale of hogs and corn on the same farm from year to year is discussed later (in Part III). In this section the discussion will be confined to the points mentioned in the above paragraph.

Physical Character of the Farm

Farms in the same community vary greatly in their natural fertility and in the proportion of the land which is tillable. The need of maintaining or of improving the fertility of the land may call for the growing of certain crops, especially legumes. Again, some of the land may be untillable and suited only for permanent pasture. Either of these conditions will provide a large proportion of rough feeds. In planning a system of farming, unless one expects to purchase feed, the crops raised will largely determine the kinds of livestock to be kept.

Hogs Require Large Amounts of Grain and Concentrates

As we have already seen, feed normally makes up about 80 percent of the total cost of producing pork where hogs are produced in large numbers. Altho forage crops have been used in increasing amounts in recent years, they make up but a small part of the total feed cost, for hogs consume large amounts of grain and other concentrated feeds compared with the amount of forage they utilize. In these studies over 460 pounds of feeds exclusive of pasture were required for each 100 pounds gain in weight. The amount of pasture and other

roughage used would be equivalent to not more than 150 pounds on the dry-roughage basis, or to about one-fourth of the total weight of feed. Moreover, the roughage used by hogs must be mainly of the succulent and more valuable kinds.

The economic place of the swine enterprise in the farming system often depends, therefore, on whether the surplus roughage feeds can be economically sold or turned back to the soil. Since good cropping systems in the corn belt produce from one to two times as much roughage (including hay, straw, and corn stover) as grain by weight, the economical utilization of legume crops and the by-products of grain production are of vital importance to the profitable operation of most farms. In the utilization of such roughages hogs cannot be considered to have an important place except as they fit in with the production of other livestock. It may well be observed, however, that in so far as hogs can utilize forage crops they can make the best use of legumes. They therefore provide a direct income from the legumes which are needed in a good system of soil improvement.

In the areas represented by these studies quite a difference exists in the amounts and kinds of feeds used in growing hogs (Table 7).

TABLE 7.—KINDS AND AMOUNTS OF FEED CONSUMED BY HOGS FOR 100 POUNDS GAIN: HANCOCK AND FRANKLIN COUNTIES, 1913-1922; CHAMPAIGN AND PIATT COUNTIES, 1920-1925

Kind of feed	Hancock county 10-year average	Franklin county 10-year average	Champaign and Piatt counties 6-year average
	lbs.	*lbs.*	*lbs.*
Corn	424.1 (7.57 bu.)	372.9 (6.67 bu.)	437.6 (7.81 bu.)
Other grain	34.7	12.9	29.9
Mill feed	4.1	59.7	3.9
Protein supplements	18.4	14.2	31.8
Total concentrates	481.3	459.7	503.2
Roughage	3.5	4.8	6.4
Total feed (except pasture)	484.8	464.5	509.6
Value of pasture	$ .32	$ .24	$ .73
Pasture days[1]	3.88	6.10	7.68
Total pork produced	2,257,675 lbs.	299,669 lbs.	831,282 lbs.

[1]The term *pasture day*, as used here, indicates the amount of pasture which a mature cow or horse would consume in a day when receiving no other feed. The equivalent in hogs is equal to 1,800 to 3,000 pounds live weight, depending on the age of the hogs and the amounts of concentrates being fed.

In Hancock county corn is a major crop and hogs are fed out to good average weights. In Franklin county less corn and more wheat are produced, with the result that less corn and more mill feeds are fed. Hogs are sold at lighter weights, and so less concentrates are used. Also, the hog enterprise is small on most of the farms in Franklin county and waste feeds on which no records could be secured made up a larger part of the ration. In Champaign and Piatt counties the hogs were not handled so efficiently as on many farms in Hancock

county, where large numbers were produced. This in part accounts for the use of more feed for 100 pounds gain in these two counties.

It is apparent that horse, beef,[1] dairy, or mutton production has a distinct advantage over hog production in the use of pasture and roughage. In those enterprises pasture and roughage make up a large proportion of the feed and at some seasons roughage may be fed exclusively. Also, the roughages used include kinds which hogs cannot utilize to advantage.

Hog Production Supplements Other Livestock

On many farms hog production fits in advantageously with either beef or dairy production. In beef production hogs utilize the by-products of the feed lot. In dairy production, where the butterfat is

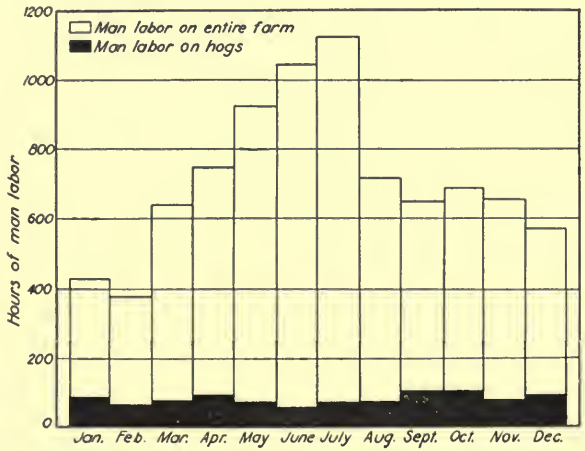

FIG. 4.—MAN LABOR REQUIRED FOR THE HOG ENTERPRISE ON A 320-ACRE FARM AND TOTAL MAN LABOR USED ON THE FARM

The above graph is based on ten years of records (1913-1922) from a farm raising both spring and fall pigs. Under these conditions the labor on hogs is quite evenly distributed thruout the year and makes up but a small part of the total farm labor.

sold, the by-product, skim milk, can be used to take the place of more expensive nitrogenous feeds.

Labor on Hogs Evenly Distributed Over the Year

Except for the farrowing period, which may come during periods of slack labor demands, the labor on hogs is quite evenly distributed thruout the year. This is especially true where both spring and

[1]See Bulletin 261 of this Station, "Cattle Feeding in Relation to Farm Management," pages 231 to 237.

fall pigs are produced. The labor distribution on one of the farms in this study which regularly produced both spring and fall pigs thruout the year is typical of farms operating on this basis (Fig. 4).

In contrast, the labor used in crop production or in feeding cattle and sheep is concentrated at certain periods of the year. Cattle and sheep fed in winter may be said to market labor to better advantage than hogs because there is not much use for the available labor at that time. The labor required for hog production may be reduced somewhat during the summer if the hogs are allowed to make full use of forage crops. Also, the costs can be reduced considerably thru the use of self-feeders, watering systems, and by other good practices.

Large Numbers Reduce Cost

Farms producing large numbers of hogs have an advantage over those whose swine enterprise is small. This applies especially to the amount of labor required and the annual charge for use of equipment.

TABLE 8.—HOW SOME OF THE COSTS OF PORK PRODUCTION ARE AFFECTED BY SIZE OF ENTERPRISE: HANCOCK COUNTY, 1913–1922

Amount of pork produced annually	Number of records	Costs for 100 pounds of pork produced			
		Man hours	Horse hours	Buildings and equipment	Miscellaneous
Under 15,000 pounds	13	3.91	.659	$.257	$.244
15,000 to 25,000 pounds	29	2.50	.614	.159	.209
25,000 to 35,000 pounds	20	2.57	.501	.136	.248
Over 35,000 pounds	20	2.03	.454	.135	.180

In Hancock county it was found that on farms producing less than 15,000 pounds of pork approximately 4 hours of man labor and ⅔ hour of horse labor were required for 100 pounds of pork, while on farms producing over 35,000 pounds, 2 hours of man labor and ½ hour of horse labor were used.

Likewise, building and equipment expenses bear a close relation to the amount of pork produced. They are comparatively low since hogs do not require expensive equipment. On some farms, however, unwise expenditures materially increase the charge for this item. Large producers had an expense of only 14 cents for equipment and 18 cents for miscellaneous expense, while on the farms with the smaller production these items amounted to 26 cents and 24 cents (Table 8). Advantages with respect to equipment costs, in larger production, are readily recognized. Water systems, self-feeders, and hog waterers, for example, may care for a large number of hogs as satisfactorily as for smaller numbers. A large-sized enterprise frequently may justify the use of more expensive equipment than may be economical where production is small (Tables 2, 3, 4, 5, 6).

The interest charge on hogs does not change with the number of hogs produced, but it may be noted that it is relatively light, amounting usually to less than 3 percent of the total cost. Since hogs increase rapidly and mature at an early age, the necessary investment in breeding stock is low compared with the value of young animals produced.

While it might seem that with large herds there is more danger of the premises becoming infected with disease, and greater losses in case of infection, on the other hand, a large producer is apt to give more attention to sanitation and disease control. There is no evidence from the studies made that the percentage of loss is any higher on farms having a large enterprise.

Hogs Reduce Expense of Harvesting Crops

When crops raised on the farm, including grains and legumes, are fed off rather than harvested, swine production takes a more important place in the economical operation of the farm than it otherwise would.

The present cost of harvesting corn is about 10 cents a bushel, according to recent studies. When hogs are used to harvest the crops, the amount of expensive farm labor is reduced at the growing and harvesting seasons, which are the busiest of the year. Not only are the crops harvested with less labor, but less time is needed for the daily hog chores.

While feeding-off crops often involves additional labor and material to fence fields to hold hogs, the annual cost for these items is much less than the cost of harvesting the crop. Moreover, fencing can be done during off seasons and on days when it is too wet to harvest crops or to do other field work. Altho this practice may not give the most efficient use of feed, there is a gain from the saving of labor and the return of fertility to the land.

Hogs Rightly Handled Help Maintain Soil

Many farmers who are practicing improved methods of hog sanitation and are using movable houses which are taken from field to field on succeeding years are using hogs successfully in helping to maintain or to build up the soil. When crops are completely fed off with hogs confined in the field growing the crop, a minimum of plant food is lost and the problem of maintaining the soil for the following year is largely solved.

In these studies no credit was given hogs for soil improvement because the practices employed in handling them are not standardized and most farmers are not yet making the best use of them as a means of improving the soil. While it is difficult to place a value on manure for crop production, field experiments conducted by the Agronomy Department of the University of Illinois indicate that $1.50 a ton is

a conservative estimate when the manure is applied to the brown silt loam soil found thruout central Illinois. The feeding-off of a 50-bushel corn crop, together with the feeding of 8 to 10 percent of protein concentrates, may be considered the equivalent of returning 3 tons of manure to the land.[1] A credit of $4.50 an acre under these circumstances might therefore be given to the hog enterprise.

Where a considerable part of the feeding is done in dry lots and little of the manure is returned to the tilled land, it is difficult to determine a fair credit. Also, the value of the manure recovered is offset in part by the cost of hauling it to the field. However, the individual hog producer may well consider the advantage of hog production in helping to maintain the productivity of his land and credit his hog enterprise to the extent that it contributes to that end.

Possibilities of Finishing Hogs for Better Seasonal Markets

Hogs sell better at certain times of the year than at others, owing largely to the uneven supply going to market. Spring pigs usually command a higher price in August, September, and October than in November, December, and January. Fall pigs similarly are usually marketed at a better price in March, April, and May. One may well consider, therefore, directing his hog production so as to bring the hogs to normal market weight at a time when the better prices are to be expected. The possibility of feeding to heavier or lighter weights, in response to temporary market conditions, which is another matter, is discussed at length in Part III, pages 169 to 178.

Over the twenty-five-year period from 1901 to 1925 the highest seasonal price of hogs occurred on the average during the fall months and again during the spring, with the highest monthly price in September (Fig. 5). During the five years from 1921 to 1925 prices were highest in March and April and again in August, September, and October. However, the price in September and October has been somewhat lower than in August. The average price in March is apt to be relatively much higher than at any other time of year, tho occasionally when bad roads delay winter marketing until that time, prices tend to stay low.

While both curves in Fig. 5 show the price of hogs to have been higher in spring and again in fall than at other times of the year, the difference in the trend of prices shown in the two curves calls for further explanation and the question may be raised whether the curve for the later period (1921-1925) may not be a better basis for judging the seasonal variation that farmers are now likely to encounter than the curve representing the past twenty-five years.

The reason for the differences in the two curves probably is found in the change which has taken place in the methods of raising hogs

[1]Based on "Feeds and Feeding" by Henry and Morrison.

during the past twenty-five years. Under the dry-lot method of feeding which prevailed prior to about fifteen years ago, very few hog raisers succeeded in bringing their spring pigs to market weight by September. Naturally considerable premium was paid for spring pigs which could be put on the market at that time. Also, a larger proportion of the hogs than at present were held until they were at least a year old, and this tended to spread out the heavy marketing of spring pigs from about November thru the next May or June. Gradually the practice of better disease and parasite control and better

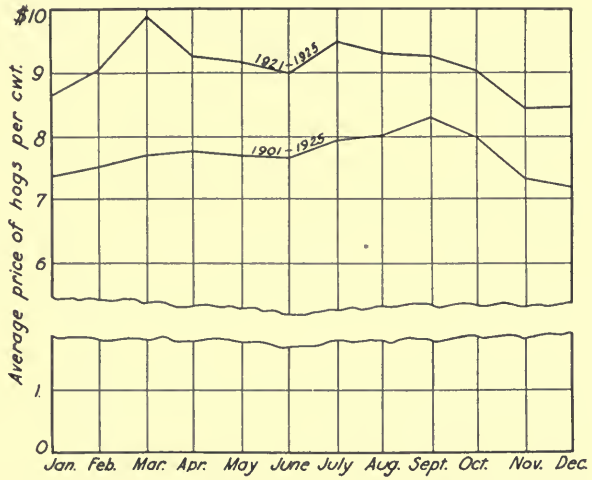

FIG. 5.—AVERAGE MONTHLY PRICE OF HOGS AT CHICAGO, 1901-1925 AND 1921-1925

The prices for the five-year period 1921-1925 are probably better indicators of future monthly variations than are those for the twenty-five-year period.

feeding methods, together with a change in the type of hog produced, has made it possible to market hogs at an earlier age. A larger proportion of the spring pigs are therefore reaching market in August and September and the bulk are marketed before March; this has been reflected in the upward trend in prices from January to March over the past five years. A few producers of fall pigs are able to put them on the market in March, when fewer hogs are normally marketed. The greater part of the fall pigs, however, are not marketed until April, May, or June, and this tends to depress prices during the latter part of this period.

The foregoing facts may then indicate that the normal seasonal variation in the price of hogs is changing more definitely to that shown during the past few years. While it is of course true that the prices from 1921 to 1925 have been influenced by rather abnormal market

conditions, reflecting some of the consequences of the agricultural depression, the period is long enough to justify giving consideration to the price tendencies evidenced during that time.

Of equal consideration with *price,* in determining the time of year when it will be most advantageous to market hogs, is the matter of the *cost* of producing hogs for different seasonal markets. The opportunity of using forage, the possibility of feeding off grain crops (thus saving the cost of harvesting and feeding), the relative price and feeding value of old and new corn, and the larger credit which may be given hogs for the fertility returned to the soil where crops are fed off, all enter into the question. Also, in planning to feed off crops, it is advantageous to plan late spring farrowing in order to avoid early spring losses from poor weather conditions.

Spring pigs finished for sale in August, September, or October must, of course, be grown rapidly, and a full grain ration is therefore essential. This means that most of the gains must be made on old corn and that the full use cannot be made of forage crops. With hogs finishing two or three months later, more use may be made of forage and the new corn crop can be used at least in part; this tends to reduce the cost of feed at least to the extent of the cost of holding the old corn in storage for a year. Also, a part of the new corn crop may be fed off, and this reduces the amount of high-priced labor otherwise necessary in harvesting it.

While, as already noted, the price of hogs is usually high in March, April, and May, the cost of finishing fall pigs for the spring market under farm conditions usually is higher than in finishing spring pigs for the fall market. This is due to less use of forage crops, the greater amount of labor required, and the difficulty of controlling disease and parasites when the hogs are not on pasture. Also, conditions on many farms during the winter are not conducive to the most economical gains.

Unless a greater difference than the average exists between the price of old and new corn, the advantage of the cheaper gains on new corn may be entirely offset by lower prices. The small supply of hogs sent to market during the early fall months tends to keep up the prices at that season, but as more producers get into the habit of marketing hogs then, the advantage will tend to disappear. Of course when the hog supply is short, prices will tend to stay high; consequently there are years when little or no disadvantage results from marketing during the winter months. Under such conditions hogs may well be held to heavier weights, as discussed in Part III.

Men Vary in Ability to Keep Costs Down

Success in hog production is dependent largely upon skilful management. This fact may be illustrated by the records of the ten farms in Champaign and Piatt counties shown in Table 9 and Fig. 6.

The average cost of producing pork on these ten farms ranged from $7.76 to $13.72 a 100 pounds, a difference between the lowest and highest cost of $5.96. None of the men were large hog producers, for only 2,000 to a little over 12,000 pounds of pork was produced annually per farm. The cost of feed is the item mainly responsible for the wide variations among the ten farms. This cost ranged from $5.91 on Farm 2 to $10.70 on Farm 10. The amount of concentrates fed for 100 pounds of gain varied from 488 pounds on Farm 5 to 791 pounds on Farm 10. Man labor varied from 1.6 hours on Farm 1 to 6.7 hours on Farm 9.

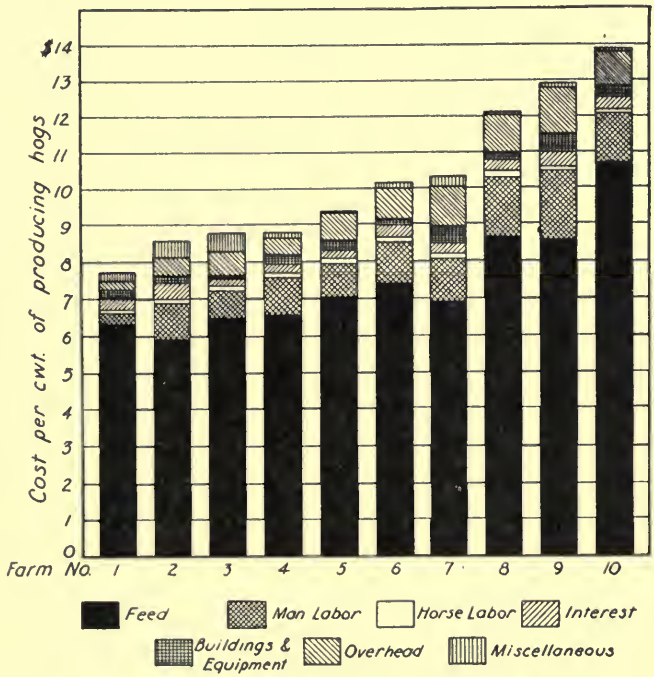

FIG. 6.—VARIATIONS IN THE COST OF PRODUCING 100 POUNDS OF PORK ON TEN FARMS IN THE SAME AREA

Differences in the management ability of the operators are strikingly illustrated by these variations in cost on ten Champaign and Piatt county farms during the four years 1922-1925.

These facts are significant because they represent the average of a four-year period. The differences are then due, not to misfortune, but to typical differences in management. A man occasionally has a poor year, but some of these men were consistently more successful than others. When some men are using 60 percent more feed and four times as much labor as are other men, it is apparent that there is large opportunity for improvement in methods of production.

TABLE 9.—COST OF PRODUCING HOGS ON TEN FARMS IN CHAMPAIGN AND PIATT COUNTIES: BY FARMS, FOUR-YEAR PERIOD, 1921-1924

	Average cost of 100 pounds of pork produced										
Farm No.	1	2	3	4	5	6	7	8	9	10	Average
Feed	$ 6.35	$ 5.91	$ 6.47	$ 6.55	$ 7.09	$ 7.41	$ 6.93	$ 8.67	$ 8.59	$10.70	$ 6.96
Man labor	.36	.95	.72	1.03	.88	1.11	1.13	1.57	1.84	1.31	.96
Horse labor	.09	.12	.13	.10	.13	.11	.13	.15	.08	.07	.12
Interest	.26	.44	.22	.22	.21	.32	.28	.29	.41	.29	.30
Buildings and equipment	.21	.17	.02	.18	.26	.13	.41	.20	.49	.31	.23
Overhead	.24	.53	.64	.53	.78	.80	1.18	1.15	1.37	.96	.73
Miscellaneous	.25	.46	.56	.19	.04	.32	.28	.07	.09	.08	.26
Total expense	$ 7.76	$ 8.58	$ 8.78	$ 8.80	$ 9.39	$10.20	$10.34	$12.10	$12.87	$13.72	$ 9.56
Amount of feed	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*
Corn	456.0	499.0	494.1	459.4	413.1	605.4	488.2	653.9	678.4	757.8	507.4
Oats	24.6	1.0	38.4	1.4	55.6	0.0	26.3	8.2	4.7	10.1	20.9
Other grain	.4	.6	0.0	0.0	5.0	6.9	32.7	.7	2.8	0.0	5.9
Mill feed	7.9	13.9	2.1	.2	12.6	7.0	3.3	1.6	0.0	0.0	7.6
Tankage equivalent	19.7	10.2	21.6	42.0	1.8	20.2	25.2	13.2	19.6	23.2	16.4
Total concentrates	508.6	524.7	556.2	503.0	488.1	639.5	575.7	677.6	705.5	791.1	558.3
Roughage fed	20.0	3.53	18.54	58.0	.....	.....	7.0	11.9	.....	.....	9.58
Pasture days	5.32	4.84	4.84	5.28	4.36	7.43	5.68	7.7	5.80	8.44	5.49
Hours of man labor	1.64	4.11	3.12	4.47	3.68	4.86	4.52	6.49	6.66	5.70	4.09
Hours of horse labor	.57	.96	.98	.74	.87	.41	.62	1.12	.43	.44	.77
Total pork produced, pounds	28 820	49 260	16 185	13 975	42 755	18 847	28 577	9 772	8 143	10 775	.....

It is not the purpose of this bulletin to analyze in detail the extent to which different practices are responsible for the wide variation in cost of producing pork, but a study of these farms shows that the more important factors accounting for the lower costs are a larger number of pigs weaned per litter, better sanitation and disease control, the use of forage crops, better selection of feeds, better use of labor and equipment, and the larger size of the enterprise. A producer may well scrutinize the management of his hog enterprise with these points in mind.

PART III—HOG PRODUCTION A MEANS OF ADJUSTING SALE OF FARM PRODUCTS TO MARKET CONDITIONS

To the corn-belt farmer hog production offers a means by which, with a minimum disturbance to other farm plans, he can best take advantage of changing price conditions. The swine enterprise is flexible compared with other livestock enterprises. Hogs may be increased in numbers in a short time, and they may be sold at varying weights without meeting serious price disadvantages. Because of this flexibility the proportion of products sold as corn or as hogs can be changed within a relatively brief period of time.

The acreages of the staple crops on most farms cannot be changed so as to take advantage of the markets because yields cannot be anticipated and the relative price of staple crops is dependent largely upon total production. Also, crop enterprises cannot be changed in size without danger of interfering with the rotation of crops or with the adjustments of labor and power in such a way as to increase the costs of operation. As compared with crop production, the swine enterprise requires a relatively small amount of labor, which is well distributed thruout the year, and its size therefore can be changed considerably without seriously interfering with the economic organization and operation of the farm.

Recognizing that the prices of corn and hogs do not bear a constant relation to each other and that hog production is flexible, it is evident that the most successful hog producer will be the man who, in addition to producing hogs efficiently, adjusts the production of hogs to price conditions.

Forces which help determine the demand for and the supply of hogs brought to market, and the resulting price changes, are analyzed in Bulletin 293 of this Station, "Adjusting Hog Production to Market Demand." As brought out in that study, when the relative prices of corn and hogs can be anticipated, a larger or smaller number of brood sows can be kept and either one or two litters of pigs raised each year. Within a year this will materially change the numbers available for market. At times feeder pigs may be bought to good advantage.

While the above points are well recognized, less study has been given to the possibility of selling hogs at lighter or heavier weights. Hogs of the right type may be marketed at 175 pounds, or if conditions warrant, they may be fed to 300 or even to 350 pounds. The producer of corn and hogs can therefore change considerably the proportion of corn and hogs which he sells without changing the number of hogs raised. The advantage of this practice of feeding to lighter or heavier weights in order to vary the marketing of corn and hogs deserves careful consideration because of the short time required to make the adjustment.

Selling at Light or Heavy Weights

With a large supply of corn available at relatively low prices, the main problem of the man with hogs on hand is the weight to which it is profitable to feed.[1] In deciding this point he must give due consideration to five factors, in addition to his own efficiency in feeding hogs and the thrift of the hogs: (1) the number of hogs and the amount of corn available, (2) the current prices of corn and hogs, (3) the probable trend of the hog market, (4) the additional amount of feed required to produce 100 pounds of gain as the hogs increase in weight, and (5) the probable relative prices of light and heavy hogs when marketed.[2]

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[1]Over a long period of time the average market price of hogs per hundredweight has been equal to the market price of 11.4 bushels of corn. During the past fourteen years there have been four periods when it has taken less than this amount of corn to equal the price of 100 pounds of hogs—1915, 1917, 1920, and again in 1923 and 1924. At other times 11.4 bushels of corn more than equalled the price of 100 pounds of pork. These cycles of high and low hog prices in relation to corn prices have lasted about 42 months on an average. The man who consistently brings hogs to 250 pounds at a cost equal to the price of 9 bushels or less of corn for every 100 pounds of gain will find few times when he cannot produce hogs at a profit. The less efficient producer, whose costs exceed the price of 14 bushels of corn, will seldom realize a profit. Between these extremes, however, are many men who, by giving more attention to market conditions, could guide production to more profitable ends. That is, even tho they may not be the most efficient producers so far as costs of production are concerned, they could increase their incomes by learning better how to adjust their production to market conditions.

[2]The year 1926 illustrates well the advantages to be gained by feeding hogs to heavy weights. The farm price of 100 pounds of hogs during this year was equal to the farm price of more than 16 bushels of corn. Hogs were scarce, while corn was abundant on most farms. Also, there was little prospect of any increase in the number of hogs to go to market either late in the year or early in 1927, and the outbreak of cholera in the fall still further reduced the number going to market. The fall of 1923, on the other hand, offers an example of a time when most producers could not have afforded to feed hogs to heavy weights, for from August 1, 1923, until a year later the price of 100 pounds of hogs was less than the price of 10 bushels of corn.

Two facts suggested by the above statement deserve emphasis; namely, that success in feeding hogs to heavy weights depends upon a man's efficiency in production; and that as hogs increase in weight more feed is required for a given gain.

Feed Required for Gains at Different Weights

Under good conditions about 350 pounds of feed, including grain and protein concentrates, are required to put 100 pounds on hogs weighing between 100 and 150 pounds, while about 450 pounds of feed are necessary to put this gain on hogs that weigh over 300 pounds. On the basis of the information given in Table 10, the probable feed

TABLE 10.—FEED REQUIRED TO PRODUCE 100 POUNDS OF GAIN ON HOGS AT DIFFERENT WEIGHTS[1]

In gaining from—	Corn	Tankage	Total
	lbs.	*lbs.*	*lbs.*
100 pounds to 150 pounds	314.6	30.4	345
150 pounds to 200 pounds	343.2	29.8	373
200 pounds to 250 pounds	370.9	30.1	401
250 pounds to 300 pounds	398.5	30.5	429
300 pounds to 350 pounds	425.0	31.0	456

[1]Calculated from data reported in Bulletin 335, Ohio Agricultural Experiment Station.

TABLE 11.—FEED COST OF PUTTING 100 POUNDS OF GAIN ON HOGS OF DIFFERENT WEIGHTS.[1]

(Tankage at $70 a ton)[2]

	Cost of feed in gaining from—				
	100 pounds to 150 pounds	150 pounds to 200 pounds	200 pounds to 250 pounds	250 pounds to 300 pounds	300 pounds to 350 pounds
Corn required for 100 pounds gain[3]	315 pounds	343 pounds	371 pounds	399 pounds	426 pounds
Price of corn per bushel—					
$ .50	$3.87	$4.12	$4.37	$4.62	$4.86
.55	4.15	4.42	4.70	4.97	5.24
.60	4.43	4.73	5.03	5.33	5.62
.65	4.71	5.04	5.36	5.69	6.00
.70	4.99	5.34	5.69	6.04	6.38
.75	5.27	5.65	6.02	6.40	6.76
.80	5.56	5.96	6.36	6.76	7.14
.85	5.84	6.26	6.69	7.11	7.52
.90	6.12	6.57	7.02	7.47	7.90
.95	6.40	6.87	7.35	7.82	8.28
1.00	6.68	7.18	7.68	8.18	8.66

[1]To determine the *total* cost of putting additional weight on hogs, add 10 to 15 percent to the above cost to cover man and horse labor, use of equipment, risk or insurance, interest on investment, and miscellaneous items. The percentage will vary, depending upon the equipment and the facilities for handling hogs.

[2]If the price of tankage is higher (or lower) than $70, add to (or subtract from) the values given in the table 7.5 cents for each $5 change in price.

[3]In addition to the corn, 30 pounds of tankage on the average will be required for each 100 pounds of gain thruout.

cost of producing 100 pounds gain on hogs of different weights has been calculated with different prices for corn. These costs are given in Table 11.

Of course these tables are to be taken merely as guides. *The feed costs are what may be expected only if the hogs are handled properly and fed a well-balanced palatable ration.* If either the feeds or the animals are not of good quality, or if conditions under which they are fed are not satisfactory, more expensive gains can certainly be expected. Whether or not the figures are representative of any particular farm depends upon the efficiency of the manager in handling hogs, and of this the individual must be his own judge.

Thrifty hogs properly fed and handled may be expected to gain about 50 pounds a month after reaching a weight of 150 pounds. Hogs weighing 200 pounds in September, if full fed, should weigh 350 pounds in December, or fall pigs weighing 200 pounds in March should weigh 350 pounds in June under favorable conditions. The comparison of the prices of light and heavy hogs should be made, then, between the current price of light hogs and the price of heavy hogs about three months later.

Probable Prices for Different Weights When Marketed

Except for the months of November, December, January, and February, and occasionally during these months, light hogs usually sell for a higher price than heavy hogs at the same date (Table 12). Almost without exception, however, the prices of light hogs in August, September, and October are considerably higher than the prices of heavy hogs three months later, when the bulk of spring pigs are marketed. If fall pigs are thrifty, there is usually an advantage in feeding to heavy weights, since the price of heavy hogs in May, June, and July is usually good compared with the price of light hogs three months earlier.

Table 13 has been arranged to show the value of spring pigs if sold in August, September, October, or November at a weight of 200 pounds, and the value of the same pigs if carried to 350 pounds and sold three months later. An example of how this table may be read would be this: In August, 1922, 200-pound hogs were selling in Chicago for $9.84 a hundredweight, or for $19.68 a head. The same hog fed out until November to a weight of 350 pounds would sell for $8.25 a hundredweight, or $28.88. The hog fed to heavy weight would be worth $9.20 more than if sold at the light weight. After deducting the cost of tankage and other costs excepting grain, there would be $7.13 left to pay for the grain fed. Assuming that it would require 10.7 bushels of corn to secure this added weight, 67 cents a bushel would be returned for the corn fed. In that month the corn in Chicago was worth 63 cents a bushel on a new-corn basis; hence a

TABLE 12.—AVERAGE MONTHLY PRICES OF LIGHT AND HEAVY HOGS ON THE CHICAGO MARKET[1]
(Per hundredweight)

Months	5-year average ending June 30, 1914		5-year average 1916-1920		1921		1922		1923		1924		1925		5-year average 1921-1925	
	Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy	Light	Heavy
January	$7.64	$7.72	$13.33	$13.44	$9.72	$9.36	$8.27	$7.78	$8.55	$8.21	$7.01	$7.23	$9.81	$10.71	$8.67	$8.66
February	7.86	7.46	13.83	13.89	9.90	9.20	10.03	9.63	8.31	7.96	7.00	7.18	10.73	11.26	9.19	9.05
March	8.44	8.36	15.17	15.23	10.65	9.64	10.72	10.39	8.44	8.15	7.27	7.41	13.46	13.74	10.11	9.87
April	8.33	8.26	15.70	15.52	8.96	8.34	10.59	10.31	8.26	8.03	7.26	7.42	12.52	12.58	9.52	9.34
May	8.06	7.95	15.68	15.59	8.56	8.29	10.76	10.49	7.66	7.46	7.23	7.46	12.15	12.15	9.27	9.17
June	8.04	7.93	15.51	15.31	8.39	8.23	10.78	10.51	7.02	6.94	6.90	7.26	12.26	12.60	9.07	9.11
July	8.06	7.94	15.99	15.76	10.47	9.96	10.78	10.32	7.32	7.18	8.07	8.26	13.62	13.60	10.05	9.86
August	8.21	7.83	16.43	16.06	10.25	9.47	9.84	8.88	7.98	7.91	9.64	9.82	12.89	12.99	10.12	9.81
September	8.36	7.99	16.65	16.24	8.39	8.03	9.86	9.10	8.52	8.50	9.61	9.84	12.64	12.82	9.80	9.66
October	7.92	7.92	14.71	14.52	8.17	8.04	9.38	9.17	7.41	7.64	9.85	10.62	11.44	11.58	9.25	9.41
November	7.36	7.51	14.11	14.25	7.12	7.08	8.23	8.25	6.76	7.04	8.52	9.56	11.30	11.37	8.39	8.66
December	7.32	7.50	13.40	13.49	7.25	6.90	8.30	8.23	6.74	7.03	8.89	10.11	11.14	10.86	8.46	8.63
Average	7.97	7.86	15.04	14.94	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9.33	9.27

[1]The data for the five-year period ending June 30, 1914, and the period 1916-1920 were taken from the Drovers Journal Year Book; those for the five-year period 1921-1925 were taken from Statistical Bulletin 18 of the U. S. Department of Agriculture.

TABLE 13.—DIFFERENCE IN VALUE OF SPRING PIGS WHEN SOLD AS LIGHT AND AS HEAVY HOGS ON THE CHICAGO MARKET, AND THE RETURNS FOR A BUSHEL OF CORN WHEN FEEDING TO HEAVIER WEIGHTS

200-pound hogs			350-pound hogs			Difference in value of light and heavy hogs	Difference less tankage and other costs except grain[1]	Return per bushel of corn[2]	Average price for new corn based on No. 3 corn at Chicago[3]
Year and month sold	Price per cwt. of hogs weighing 150-200 pounds	Value per hog	Month sold	Price per cwt. of hogs weighing over 250 pounds	Value per hog				
1921									
August	$10.25	$20.50	November	$ 7.08	$24.78	$ 4.28	$ 2.21	$ .21	$ .45
September	8.39	16.78	December	6.90	24.15	7.37	5.30	.50	.43
October	8.17	16.34	January	7.78	27.23	10.89	8.82	.82	.44
November	7.12	14.24	February	9.63	33.70	19.46	17.39	1.63	.46
1922									
August	9.84	19.68	November	8.25	28.88	9.20	7.13	.67	.63
September	9.86	19.72	December	8.23	28.80	9.08	7.01	.66	.66
October	9.38	18.76	January	8.21	28.74	9.98	7.91	.74	.66
November	8.23	16.46	February	7.96	27.86	11.40	9.33	.87	.67
1923									
August	7.98	15.96	November	7.04	24.64	8.68	6.61	.62	.86
September	8.52	17.04	December	7.03	24.60	7.56	5.49	.51	.80
October	7.41	14.82	January	7.23	25.30	10.48	8.41	.79	.71
November	6.76	13.52	February	7.18	25.13	11.61	9.54	.89	.70
1924									
August	9.64	19.28	November	9.56	33.46	14.18	12.11	1.13	1.04
September	9.61	19.22	December	10.11	35.38	16.16	14.09	1.32	1.06
October	9.85	19.70	January	10.71	37.48	17.78	15.71	1.47	1.10
November	8.52	17.04	February	11.26	39.41	22.37	20.30	1.90	1.13
1925									
August	12.89	25.78	November	11.37	39.80	14.02	11.95	1.12	.79
September	12.64	25.28	December	10.86	38.01	12.73	10.66	1.00	.74
October	11.44	22.88	January	11.77	41.20	18.32	16.25	1.52	.73
November	11.30	22.60	February	12.00	42.00	19.40	17.33	1.62	.71
Five-year average 1921-1925									
August	$10.12	$20.24	November	$8.66	$30.31	$10.07	$ 8.00	$ .75	$ .75
September	9.80	19.60	December	8.63	30.20	10.60	8.53	.80	.73
October	9.25	18.50	January	9.14	31.99	13.49	11.42	1.07	.73
November	8.39	16.78	February	9.61	33.64	16.86	14.79	1.38	.72

[1]In the above table 50 cents is allowed to cover the cost of items other than feed in carrying a hog from 200 pounds to 350 pounds. It is assumed also that tankage will cost $70 a ton, or that the 45 pounds of tankage which might be required would cost $1.57. The difference in the total value of light and heavy hogs is reduced by $2.07, therefore, to cover cost of tankage and other costs except grain.

[2]It is assumed that under good conditions 10.7 bushels of corn will be required to make the additional gain of 150 pounds.

[3]During fall and early winter farmers in general are using new corn for feeding. This seldom grades as good as No. 3, which at this season is old corn. The prices used here are therefore for No. 3 corn reduced by 7 percent to put them on a new corn basis. This is a conservative estimate of the cost of holding cornon the farm for a year.

TABLE 14.—DIFFERENCE IN VALUE OF FALL PIGS WHEN SOLD AS LIGHT AND AS HEAVY HOGS ON THE CHICAGO MARKET, AND THE RETURNS PER BUSHEL OF CORN WHEN FEEDING TO THE HEAVIER WEIGHTS

200-pound hogs			350-pound hogs			Difference in value of light and heavy hogs	Difference less tankage and other costs except grain	Return per bushel of corn	Average price of No. 3 corn at Chicago
Year and month sold	Price per cwt.	Value per hog	Month sold	Price per cwt.	Value per hog				
1921									
February	$ 9.98	$19.96	May	$ 8.19	$28.66	$ 8.70	$ 6.63	$ .62	$ .60
March	10.76	21.52	June	8.01	28.04	6.52	4.45	.42	.60
April	8.84	17.68	July	10.11	35.38	17.70	15.63	1.46	.61
May	8.56	17.12	August	9.59	33.56	16.44	14.37	1.34	.60
1922									
February	10.00	20.00	May	10.51	36.78	16.78	14.71	1.37	.59
March	10.64	21.28	June	10.52	36.82	15.54	13.47	1.26	.60
April	10.42	20.84	July	10.35	36.22	15.38	13.31	1.24	.62
May	10.61	21.22	August	9.45	33.08	11.86	9.79	.91	.62
1923									
February	8.45	16.90	May	7.61	26.64	9.74	7.67	.72	.78
March	8.46	16.92	June	7.05	24.68	7.76	5.69	.53	.82
April	8.32	16.64	July	7.34	25.69	9.05	6.98	.65	.85
May	7.64	15.28	August	8.06	28.21	12.93	10.86	1.01	.87
1924									
February	7.06	14.12	May	7.35	25.72	11.60	9.53	.89	.77
March	7.23	14.46	June	7.26	25.41	10.95	8.88	.83	.79
April	7.32	14.64	July	8.44	29.54	14.90	12.83	1.20	.89
May	7.25	14.50	August	9.88	34.58	20.08	18.01	1.68	1.03
1925									
February	10.92	21.84	May	12.16	42.56	20.72	18.65	1.74	1.12
March	13.56	27.12	June	12.72	44.52	17.40	15.33	1.43	1.11
April	12.57	25.14	July	14.02	49.07	23.93	21.86	2.04	1.12
May	12.24	24.48	August	13.21	46.24	21.76	19.69	1.84	1.08
Five-year average 1921-1925									
February	$ 9.28	$18.56	May	$ 9.16	$32.06	$13.50	$11.43	$1.07	$ .77
March	10.13	20.26	June	9.11	31.88	11.62	9.55	.89	.78
April	9.49	18.98	July	10.05	35.18	16.20	14.13	1.32	.82
May	9.26	18.52	August	10.04	35.14	16.62	14.55	1.36	.84

See footnotes to Table 13.

gain of 4 cents a bushel would have been made on the additional corn fed to the hog. Such results would be obtained, of course, only under good conditions, where the hogs are efficiently handled and are making excellent gains.

The prices given in the table are Chicago prices. The information may be adapted to farm prices by reducing the difference in value between light and heavy hogs by the cost of marketing the 150 pounds additional weight. This should include shipping and selling charges. Also, the average price of corn shown in the last column of the table should be reduced by the cost of shelling and marketing it.

Table 14 shows the same information for fall pigs excepting that in the last column the average price of No. 3 corn at Chicago is used, as it is assumed that after April No. 3 corn will be available from the new crop. If a lower grade of corn were to be used, it could not be expected that there would be a similar reduction in the cost of growing the hogs out to heavier weights, as more than 10.7 bushels of corn would probably be required to secure the 150 pounds gain.

In this comparison a ration of corn and tankage has been used since it is regarded as a standard ration for hogs of the weights discussed. A farmer, however, may choose to use other feeds in securing the added weight. But, if tankage is not used, some good protein supplement will be needed to produce efficient gains, and it is probable that the cost would be equal to the cost of tankage at $70 a ton. If a less-efficient protein supplement were to be used, its lower cost would probably be balanced by the need for a larger amount of corn or other grain. While the figures here given do not have universal application, they illustrate facts which one should take into account in determining whether or not to feed hogs to heavier weights.

In the above illustrations the costs other than feed of carrying hogs from a 200-pound to a 350-pound weight are estimated at 50 cents a hog. Under some conditions these costs may be less. Where corn is hogged down, little labor and other expense, aside from feed, will be required to carry hogs to the heavier weight. Also, with this practice the greatest saving of fertility is made, as previously discussed. However, experimental work at the University of Illinois indicates that the saving in labor from hogs harvesting their own corn is partly offset by lower gains from corn fed in this way.

Seasonal Variations in Price

The average September price of hogs, compared with that at other seasons of the year during the past five years, has not been so favorable as the average price of the past twenty-five years. August seems to have become a better month than September in which to market hogs. This may be expected to continue as more farmers use sanitary measures in hog production and follow other improved practices that

will enable them to put spring pigs on the market at an earlier date and spread the marketing of hogs more evenly thru the year.

While data are not now available to show the relative cost of finishing hogs at different seasons of the year, it is true that the earlier spring pigs are finished for market the larger is the proportion of old corn required, and this tends to increase the cost of production. Of course when some pigs are put on lighter feed than others farrowed

FIG. 7.—THE CORN-HOG RATIO FROM 1913 TO 1926 BASED ON FARM PRICES FOR ILLINOIS

The graph shows the bushels of corn required each month to equal the price of 100 pounds of hogs at farm prices. The relative prices of corn and hogs may serve more or less as a guide in the production and marketing of hogs.

at the same time, they will take a longer time to reach given weight and will have to be charged with the additional carrying cost of maintenance during the longer period.

While the price received for hogs during the winter months may be relatively less than at other seasons, more of the gain will be secured from new corn, which can be charged to the hogs at a lower price. Also, the finishing of hogs during the winter months does not interfere with other farm work, as it may during the cropping season.

Using the five-year period 1921 to 1925 as a basis, there would seem to be little to gain by carrying hogs weighing 200 pounds in August or early September to a heavier weight for November marketing. If, on the other hand, the hogs do not reach a weight of 200 pounds before October or November while making normal gains, there would seem usually to be a definite gain from feeding to heavier weights for marketing the following January or February. Of course if hog prices are low or on a downward trend in relation to the price of corn, this might not be true.

In regard to fall pigs, the experience during the past five years indicates an advantage in general in feeding out to heavier weights, especially when the pigs can be carried to July or August. The marketing of fall pigs is usually distributed quite evenly over several months of the year. Hence there is no one month which is outstandingly profitable from the market standpoint. While prices of hogs are usually relatively high in March, few fall pigs reach market then, and the difference in the price of light hogs in March and heavy hogs three months later is not so great as during the fall and winter months. Also the hogs marketed at this time are all fed out on the same crop of corn, and waiting for the later markets in order to use new corn is not a factor.

Consideration of Price Trends

In deciding whether or not to feed hogs to heavier weights, the probable trend in the prices of corn and hogs should be taken into account. Producers too frequently base their decisions regarding production and marketing upon current market conditions, and neglect to take into account information which might help them to foresee market conditions two or three months later. When the price trend of hogs is definitely upward and is favorable to that of corn, there may be a marked advantage in feeding to heavier weights. But when hog prices have been for some time at a high level in relation to corn, and an increased supply of hogs or a short supply of corn is in sight, a downward trend will destroy the advantage before the hogs can be fed out to the heavier weight.

Briefly some of the factors which should be taken into consideration in planning future hog production are the facilities on the farm for handling hogs, the number of hogs on farms, as reported by various public agencies, the movement of hogs to market, the results of surveys of the intentions to breed, weather conditions, the prevalence of disease, the supply of old corn in the country, the prospect for a new corn crop, and general business conditions.

The final decision, however, whether to feed hogs out to light or to heavy weights comes back primarily to the question of a man's own efficiency in producing hogs and the thrift of the hogs on hand at the time the decision is made. In connection with the first point the

attention of the reader may well be called again to Fig. 6, page 167, and Table 9, page 168, which illustrate the wide range that occurs among different farms in the cost of producing hogs. It is evident that the reason for the differences in the results which men secure in conducting the same farm enterprise lies largely in the ability of the manager.